Fertilizer Utilization & Cost Effectiveness Resources

Nutrient Management in Forage Crops

Lindsay, a forage specialist from Vernon, shared her background in agriculture and explained her role in providing nutrient management advice across British Columbia. She outlined the 4Rs of nutrient management (right source, rate, timing, and place) and discussed the specific nutrient needs of different forage crops, noting that nitrogen is the most limiting factor for grasses while legumes require more phosphorus and potassium. Lindsay presented data showing how different fertilizer applications affect mixed stands of forage crops, demonstrating that grasses respond more strongly to nitrogen than legumes. She also covered soil pH considerations and nutrient interactions, using Mulders chart to illustrate how certain nutrients can either antagonize or stimulate the uptake of others.

Fertilizing Forages: Economic Considerations

Lindsay presented on the economics of fertilizing forages, discussing factors to consider such as cost-benefit analysis, precipitation effects, and non-economic impacts like improved livestock gains and soil health benefits. She mentioned a Manitoba calculator and Saskatchewan resource for analyzing profitability, as well as a Beef Cost of Production study for further reference. Lindsay agreed to follow up on Devin's question about aluminum's effect and to look into research on foliar versus granular fertilizer application for pivot systems.

Optimizing Fertilizer Application Strategies

Mike discussed the importance of refining fertilizer application rates for optimal yield and profitability. He suggested putting out test strips to evaluate the response to different fertilizer levels, emphasizing the need for a large enough area to accurately assess the results. Mike shared a case study from the Tebow Ranch where a mid-season application of urea resulted in a 43% increase in yield, with a positive return on investment. He also highlighted the importance of irrigation after applying urea to minimize volatilization losses.

Soil Building Network Trial Results

The meeting focused on the results of a soil building network trial with forage producers in the East Kootenay, which aimed to evaluate the benefits of mid-season urea application. Mike presented findings from the 2024 BC beef cost of production study, noting that while profitability has increased significantly since 2013, driven by record-low cattle numbers in North America, producers should prepare for future price drops. The

discussion concluded with questions about the availability of cost study spreadsheets, with Mike confirming that while the 2013 study spreadsheet is publicly available, the 2024 version is not currently accessible, though the full report can be obtained from BC Cattlemen's.

Efficient Fertigation System Overview

Doug shared his experience with fertigation, explaining how he mixes liquid nitrogen with water using a $4,000-4,500 pump that circulates the mixture at 20 gallons per hour. He noted that liquid nitrogen is 4 times more efficient than broadcast fertilizer, allowing him to apply the same amount of fertilizer more effectively across a 25-acre field. Doug also described his fertigation system's setup, which uses a "twill" to evenly distribute the mixture into the water stream, and mentioned that he rotates between different pivots to prevent algae growth and maintains the system by cleaning filters and flushing tanks regularly.

Fertilizer Management and Cost Strategies

The meeting focused on fertilizer management and cost considerations. Mike emphasized the importance of obtaining detailed cost information from fertilizer dealers, including base ingredient costs and auxiliary expenses, to make informed nutrient management decisions. Lindsay highlighted the need to consider agronomic factors, such as soil tests and expected yields, when developing fertilizer blends. Jeff announced upcoming webinars on soil testing and nutrient management. The group discussed the benefits of sharing information across the region, with Rachael encouraging continued participation in soil discussion events. Sarah shared a message from Jordi Tebow about soil building and fertilizer experiments in New Zealand. The conversation ended with plans to share upcoming case studies on cover cropping and forage rejuvenation.

Full Resources

1. https://open.alberta.ca/dataset/3438308 - Grass Nutrient Management Alberta Agriculture and Irrigation
2. https://open.alberta.ca/dataset/3446389 - Alfalfa Nutrient Management Alberta Agriculture and Irrigation
3. https://animalrangeextension.montana.edu/forage/nitrate-soil-nutrient.html - Nitrate Soil Nutrient – Montana State University
4. https://files.ontario.ca/omafra-soil-fertility-handbook-en-2022-10-13.pdf - OMAFRA Soil Fertility Handbook
5. https://calculators.masc.mb.ca/calculators/standing-hay-cost - Standing Hay Cost Calculator – Government of Manitoba
6. Article written by Livestock Drought Management Consultant - https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/agri

cultural-land-and-environment/water/drought/drought-articles/6_-_invest_in_your_forage_production.pdf

7. https://www.gov.mb.ca/agriculture/farm-management/cost-production/index.html#Forages – Forage Cost of Production Calculators – Government of Manitoba
8. https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/soils-fertility-and-nutrients/fertilizing-seeded-forages-in-saskatchewan - Fertilizing Seeding Forages in Saskatchewan

In answer to the Aluminum question:

1. https://earthwiseagriculture.net/the-mineral-wheel/ - Mulder Chart including Aluminum
2. Aluminum can have an impact in acidic soils (low pH) which can cause toxicity in excess in the plant; in that circumstance it can also cause the reduction in intake of N, P, K, Ca, Mg, and S – in some studies (most commonly Calcium, Magnesium, and Phoshorus). I have included below a couple studies talking about the impacts (both positive and negative of Al).
    1. https://www.frontiersin.org/journals/plant-science/articles/10.3389/fpls.2022.1085998/full
    2. https://www.frontiersin.org/journals/plant-science/articles/10.3389/fpls.2017.01767/full
    3. https://www.canr.msu.edu/news/soil_ph_and_aluminum_toxicity

Question on Foliar Application Studies:

1. There is a study that was done in the Peace Region - https://www.peacecountrybeef.ca/post/pasture-rejuvenation-with-soil-and-foliar-fertilizers
2. Another Study from Mississippi State University - https://extension.msstate.edu/sites/default/files/newsletter/201506.pdf
3. Note on Foliar Application in the Montana State Resource - https://animalrangeextension.montana.edu/forage/nitrate-soil-nutrient.html